

Remarks

In the Official Action mailed May 20, 2004, the Examiner rejected claims 1-12 stand under 35 U.S.C. §103(a) for allegedly being unpatentable over U.S. Patent 2,585,983 to Adams et al.

In response to the rejection applicants provide the amendments and remarks herein that are believed to place the present case in condition for allowance. Favorable reconsideration of all of the pending claims is respectfully requested.

Support for new claims 13-15 can be found starting at page 6, last paragraph and onto page 7 of the present application.

Concerning the rejection of claims 1-12 under 35 U.S.C. §103(a) over U.S. Patent 2,585,983 to Adams et al. applicants provide the following distinguishing remarks.

U.S. Patent No. 2, 585, 983 (the '983 Patent) describes a modified Friedel-Crafts alkylation between aromatic and olefin with anhydrous alkane sulfonic acid as catalyst. Applicants concede that there is nothing new about a basic alkylation process; however the claimed process is clearly distinguishable from that of the '293 patent. More specifically, the claimed invention is directed to an alkylation process to prepare the mono-alkylate from olefin-containing HCS fraction. Thus, the claimed process utilizes alkylation to produce exclusively the mono-alkylates, so that the alkylation mixture could be used directly without requiring a costly purification step. In this regard, the claimed process utilizes a mono-cyclic aromatic hydrocarbon (one ring) and a linear, alpha-(terminal) olefin. Further, a near stoichiometric amount of starting aromatic is employed and dealkylation is not utilized in order to enhance the monoalkylation, i.e., the monoalkyl aromatic product is formed directly from the alkylation in the present process.

Additionally, there are several other technical distinctions that can be clearly delineated from the attached table.

COMPARISON OF PROCESSES

	<u>US 2,585, 983</u>	Present Application
Concept	<i>Alkylation process allowing the preparation of detergent alkylate from HCS fraction. (Extensive purification is required)</i>	Alkylation process allowing the exclusive formation of mono-alkylate . (Alkylation mixture is used directly without purification)
Starting alkylating agent	HCS fraction containing olefins, oxy-compounds, and paraffin	Olefins (linear & branched)
Preferred starting aromatics	Toluene / Benzene	<i>o-Xylene Naphthalene⁽¹⁾</i>
Average aromatic – olefin molar ratio ⁽²⁾	5:1	1:1
Preferred catalyst	Anhydrous Ethane Sulfonic Acid	Anhydrous Methane Sulfonic Acid
Optimum catalyst – Olefin weight ratio ^(2,3)	85%	15%
Formation / Removal of by-product	Yes/Yes (water)	No
Efficient recycle of catalyst	No	Yes
Removal of aromatic	Yes	Not required
Washing	Required	Not required
Fractionation distillation (requirement for purification)	Yes	Not required
Required equipment	Extensive multiple-vessel	Simple single-vessel
Aromatic – Alkylate conversion	33% max	95 % minimum
Mono-alkylate / Polyalkylate weight ratio	3.3 : 1.0 maximum	18.5 : 1.0 minimum

(¹) Process for monoalkylation of naphthalene has just been developed

(²) Maximum olefin content in HCS (75%) is used

(³) Catalyst concentration needed to yield maximum concentration of "Heart Alkyliner" (Mono-alkylate)

Based on the differences between the claimed invention and Adams et al., applicants respectfully submit that the claimed invention represents a patentable departure from the teachings of Adams et al. Favorable reconsideration and withdrawal of the subject rejection is therefore respectfully requested.

Therefore, in view of the amendments and remarks presented herein, the present case is believed to be in condition for allowance, which action is respectfully requested.

Respectfully submitted,


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